FRDA REPORT 067

A SOCIO-ECONOMIC IMPACT ANALYSIS OF SILVICULTURAL EMPLOYMENT UNDER THE 1985-1990 CANADA-BRITISH COLUMBIA FOREST RESOURCE DEVELOPMENT AGREEMENT

Contractor: Deloitte Haskins and Sells
800 Courtney Street
Victoria, B.C.
V8W 1E2

Prepared for: Ministry of Forests
Industry Development and Marketing Branch
Victoria, B.C.

and

Forestry Canada
Pacific and Yukon Region
Economic Analysis Section
Victoria, B.C.

March 1989

This report has been reviewed by the British Columbia Ministry of Forests and Forestry Canada and approved for distribution. Approval does not necessarily signify that the contents reflect the views and policies of the British Columbia Ministry of Forests or Forestry Canada. Mention of trade names or commercial products does not constitute recommendation or endorsement for use.

ISSN 0835-0752

89-05057/

Canadian Cataloguing in Publication Data

Main entry under title:
A Socio-economic impact analysis of silvicultural employment under the 1985-1990 Canada-British Columbia Forest Resource Development Agrement

(FRDA report, ISSN 0835-0752; 067)

On cover: Canada/ BC Forest Resource Development Agreement

ISBN 0-662-16956-5
Fo29-19/67E

1. Forests and forestry - Employment - British Columbia.
2. Forest Resource Development Agreement (Canada). I. Deloitte Haskins & Sells Associates. II. British Columbia. Ministry of Forests. Industry Development and Marketing Branch. III. Canada. Forestry Canada. Pacific and Yukon Region. Economic Analysis Section. IV. Forest Resource Development Agreement (Canada). V. Series.

HD8039.F7262C36 1989 331.12'53495'09711 C89-092112-1

A SOCIO - ECONOMIC IMPACT ANALYSIS OF SILVICULTURAL EMPLOYMENT UNDER THE CANADA - B.C. FOREST RESOURCE DEVELOPMENT AGREEMENT

TABLE OF CONTENTS

		Page
I	EXECUTIVE SUMMARY	1
II	INTRODUCTION	3
III	SURVEY DESIGN & METHODOLOGY	5
IV	RESULTS, FINDINGS AND ANALYSIS	6
	. Introduction	6
	. Contractors	7
	. Workers	15
V	APPENDIX	21
	. CONTRACTOR QUESTIONNAIRE	
	. WORKER QUESTIONNAIRE	

I EXECUTIVE SUMMARY

Background

This report provides a profile of silviculture contractors, other than tree planters, working on FRDA contracts during the fall season of 1988. The survey is a follow-up to a survey of tree planters carried out in 1985, and although two tree planting contracts are included in this survey, the balance of 142 contracts is made up of juvenile spacing (67), brushing and weeding (40), site rehabilitation and preparation (30), conifer release (4) and fertilization (1) contracts. A total of 307 silvicultural workers participated in the survey which consisted of:

- mailed questionnaires,
- telephone interviews, and;
- on site field interviews.

A representative mix of contract types and regional coverage was achieved.

Summary of Findings

The typical contract, excluding fertilization, is 84 hectares in size and has a bid price of $39,100, for an average price of $465 per hectare. Silviculture contractors rely on FRDA Contracts for 59.8% of their silviculture income, on average.

The average crew size was 8.4 per project.

Contracts are clearly highly labour intensive - nearly 80 cents of every contract dollar is spent on wages and wage related costs. Equipment and supplies consume 15 cents, considerably higher than the 3.8 cents spent by tree planting contractors in the 1985 study.

Crew workers claim 75% of the wage bill, with supervisors next at 15.5%. Supervision costs are highest for chemical brushing and weeding contracts and lowest for conifer release projects. Wages paid to cooks and helpers constitute 1.70% of total payroll costs.

Crew members are predominately male, in the 21 - 30 age group with limited or no experience, and are recruited locally.

Ten percent of workers had attained less than high school education whereas 34% were high school graduates. The workers are reasonably well educated, but less so than the tree planting workers surveyed in 1985.

Workers had other skills and experience in a variety of other occupational areas, but 64% were in the five major categories of -

- forestry and logging (20%)
- construction and trades (18%)
- service industries (9%)
- product fabrication, assembling and repairing (9%), and
- farming, horticulture and animal husbandry (8%)

The percentage with experience in forestry and logging was double that of the 1985 tree planter survey.

Accommodation is provided by contractors for the majority of contracts (63%), mostly at no charge to employees (70%).

On average, 74.7% of total 1987 worker income was derived from silviculture contracts, with workers working an average of 19.3 weeks on silviculture projects. FRDA contracts accounted for 59.2% of total 1987 reported worker silviculture income.

II INTRODUCTION

The Government of Canada (represented by the Canadian Forestry Service) and the Government of British Columbia (represented by the Ministry of Forests) signed the Canada-British Columbia Forest Resource Development Agreement (F.R.D.A.) on May 25, 1985.

The main objective of the $300 million five-year Agreement is to manage the forest resource of the province in order to sustain and increase the resource and strengthen the employment potential of the forest industry. Specifically, the objectives of FRDA in B.C. are to:

- manage part of the backlog of non-satisfactorily restocked lands,
- manage selected forest stands intensively,
- support forest research by government and non-government organizations, and
- assist the forest industry through studies related to utilization, marketing and product development, technology transfer, and training.

To achieve the overall objectives of securing and expanding the supply of wood, which promotes the security and eventual increase of jobs in the forest sector, the following programs are being implemented on both a cost-shared and unilaterally-funded basis:

- backlog reforestation,
- intensive forest management, and
- implementation, communication and evaluation.

A key requirement of the FRDA is to conduct a comprehensive assessment of the programs in relation to stated objectives. This survey project was directed towards assessing the employment impact of silvicultural activities as funded through the FRDA. The focus was the Fall (1988) season programs incorporating all field subprograms ranging from backlog reforestation e.g., planting to intensive forest management

activities, e.g., brushing, weeding, juvenile spacing, conifer release, fertilization.

To some extent this survey is a follow-up to a survey conducted in 1985 for the Canadian Forestry Service, Pacific Forestry Centre and the B.C. Ministry of Forests and Lands by Messrs. Fraser and Howard entitled "Economic and Social Aspects of Tree Planting in British Columbia; A Survey of Workers and Contractors". As the title suggests, this latter survey was limited to tree planting contractors and workers, whereas this survey, as previously indicated, incorporates a wider range of silvicultural activities. Human resources issues in the B.C. Silviculture industry were reviewed in a 1988 Report prepared for the Silviculture Joint Adjustment Committee.

The Management Consulting firm of Deloitte Haskins & Sells (DH&S) was engaged in September 1988 to conduct this current assignment.

The key objective of this study was to identify the nature and extent of employment generated by the FRDA funded silviculture programs within the Fall (1988) season, with emphasis on both backlog reforestation and intensive forest management subprograms.

The study approach involved soliciting the input and support of both the Western Silvicultural Contractors' Association and the Pacific Reforestation Workers' Association in the design of the survey. This was achieved and we are indebted to Mr. Dirk Brinkman of the W.S.C.A. and Mr. Sven Andersen of the P.R.W.A. for their cooperation and advice in this undertaking.

The survey involved two separate groups -

- silvicultural contractors, and
- silvicultural workers

The survey techniques were a combination of -

- mailed questionnaires
- telephone interviews, and
- on site field interviews

The logistics of conducting such a survey are not insignificant given-

- the mobility of the workforce
- the intensity of the fall silvicultural activity
- the remote locations of many of the worksites, and
- the reluctance of some to participate in the survey

Notwithstanding these constraints, we were encouraged with the response which covered -

- 144 separate silviculture contracts carried out by 93 different contractors (48% of the 194 Contractors surveyed)
- 307 silvicultural workers

III SURVEY DESIGN AND METHODOLOGY

The objective of the survey was to obtain representative and reliable data across a spectrum of B.C. FRDA Silvicultural Contractors and Workers. The focus was on contracts that were active during the period from September 1, 1988 to November 30, 1988. The forty five district offices of the B.C. Ministry of Forests, which is responsible for the administration of the FRDA contracts, were asked to provide DH&S with details of all FRDA work undertaken in their District during the above period. Information provided included, amongst other things, contract number, contractor name, type of work, project date and location.

The Survey method then employed was essentially a census, in that all the contracts and contractors provided by the District Office were followed up by DH&S.

Written questionnaires were developed for both the Contractor and Worker populations. These are presented in the Appendix to this report.

Contractors were contacted initially by telephone and followed-up by either -

. A mailed contractor questionnaire and worker questionnaires.
. A field visit on-site.

To encourage silvicultural workers to participate in the survey they were offered the opportunity to participate in a $200 draw. The draw was subsequently won by a worker based in Sirdar, B.C.

Telephone interviews were also conducted where other techniques were not feasible for a variety of reasons.

Data were analyzed on a mainframe computer using SPSS(X) programming software.

Certain qualitative narrative comments were provided by contractors on the survey questionnaire forms. These were provided to the Federal and Provincial Governments in verbatim form.

IV RESULTS, FINDINGS AND ANALYSIS

A Introduction

Findings are presented and analyzed in two parts, the first dealing with the detailed questionnaire completed by contractors; the second with the shorter questionnaire completed by workers.

B Contractors

i) Response Rate: The questionnaire was administered as a census of

all contractors operating in B.C. in the Fall period. Questionnaires were completed and returned for 144 contracts from a census total of 330, for a return rate of 43.6% This excellent response in aggregate also reflects a representative response from all types of contracts and regions of the Province. With respect to contract types, completed questionnaires were returned for 43% of contracts in site preparation and site rehabilitation, 60% in brushing and weeding, 39% in juvenile spacing and conifer release, 14.2% in fertilization, and 66.7% in planting. With respect to region, completed questionnaires were returned for 38.6% of the contracts in the coastal region, 50.8% in the northern interior, and 41.1% in the southern interior.

ii) Findings and Analysis

Table 1

Regional Breakdown of Contracts by Type				
Type of Contract	Coast	Northern Interior	Southern Interior	Total
Site Rehabilitation		10	3	13
Site Preparation		7	10	17
Mech Brush & Weed	3	6	7	16
Chem Brush & Weed	3	6	15	24
Juvenile Spacing	14	22	31	67
Conifer Release		1	3	4
Fertilization	1	0	0	1
Planting	1	1	0	2
Sum	**22**	**53**	**69**	**144**

Table 1 shows the distribution of completed questionnaires by type of contract and region. From the total of 144 contracts, 30 were in site preparation and site rehabilitation, 40 in brushing and weeding, 71 in juvenile spacing and conifer release, 1 in fertilization and 2 in planting. By region, 22 contracts were in the coastal region, 53 in the northern interior, and 69 in the southern interior.

Figure 1

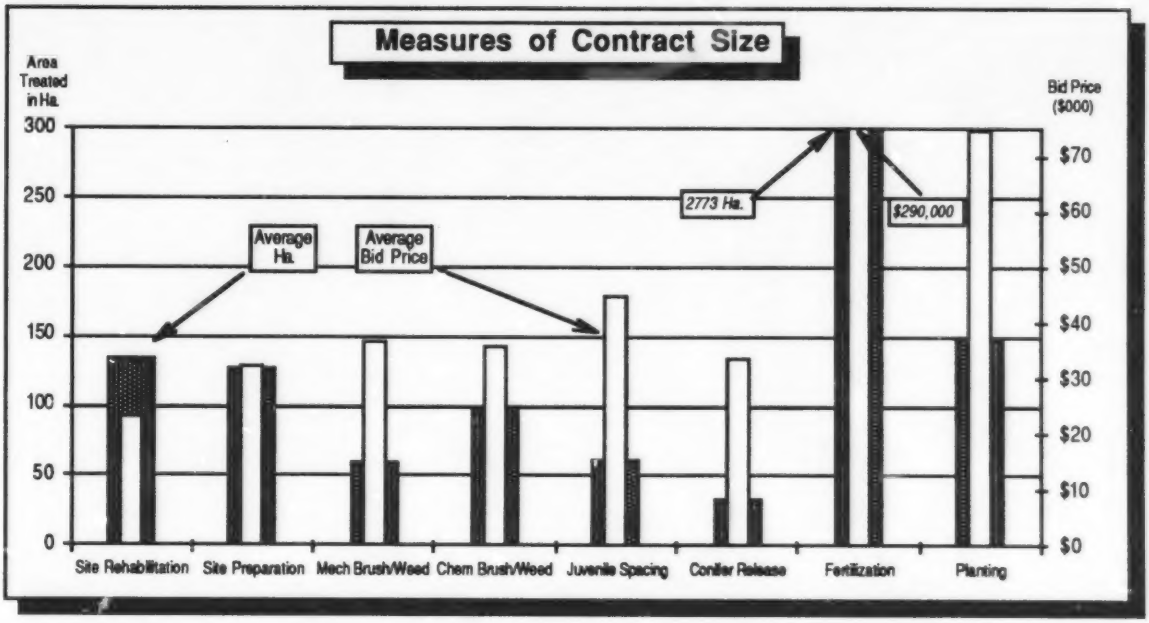


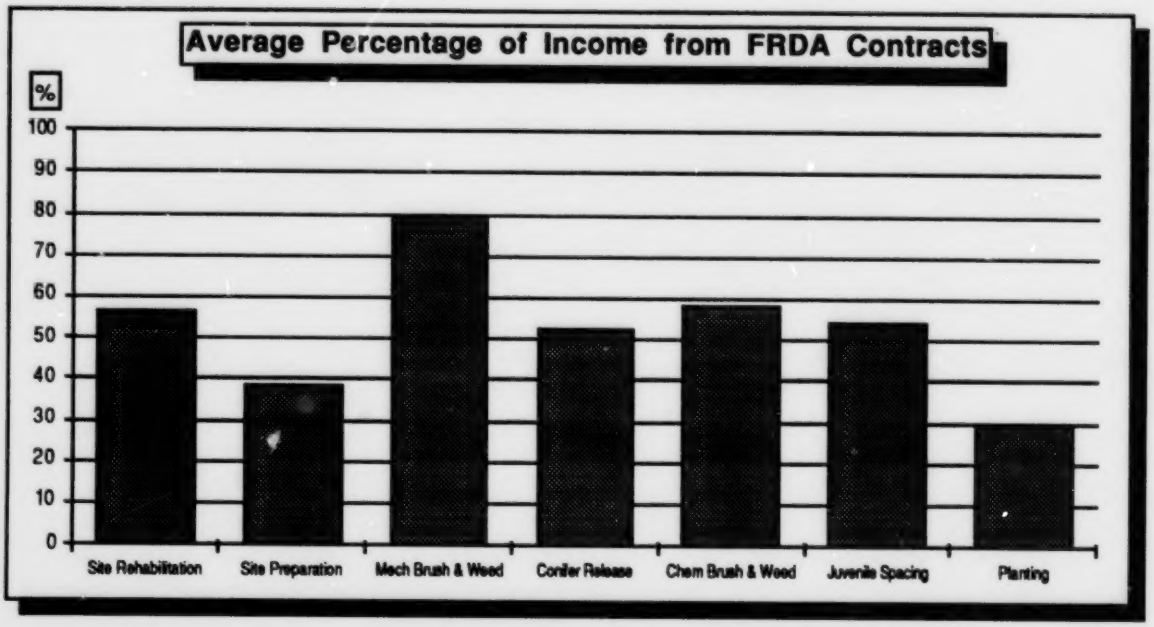
Figure 1 shows average contract size in terms of hectares and bid price for the various categories of contract. The single fertilization contract is atypical, covering 2,773 hectares at a price of $290,000. The remaining contracts ranged in average size from 34 hectares (conifer release) to 150 hectares (planting) and in average price from $23,400 (site rehabilitation) to $75,000 (planting). The overall average contract (excluding fertilization) was for 84 hectares at a bid price of $39,100.

Crew size was on average as follows, by contract category -

	Average number of Crew
Site rehabilitation	3.3
Site preparation	1.9
Mechanical brushing and weeding	10.0
Chemical brushing and weeding	8.7
Juvenile spacing	9.6
Conifer release	12.3
Fertilization	12.0
Planting	33.0

The overall average crew size was 8.4 per project (8.08 excluding planting)

Figure 2



93 Contractors reported that, on average, 59.8% of their 1987 silviculture income was derived from F.R.D.A. contracts. It was highest for mechanical brushing and weeding contractors (80.0%) and lowest for site preparation contractors (38.5%) and the two reporting tree planters (30.0%).

Figure 3

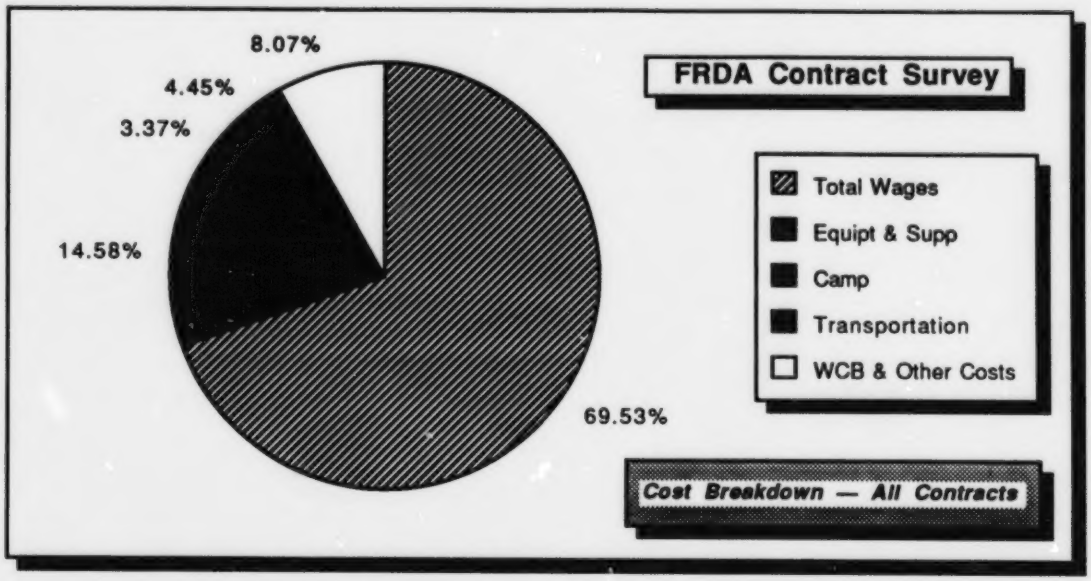


Figure 3 shows the breakdown of overall average costs for all categories of contract in all regions. Direct wage costs take nearly 70 cents of each dollar of contractor costs. If the additional 8 cents in the dollar attributable to the Worker's Compensation Board assessment and other wage-related costs is added, nearly four fifths of costs can be attributed to wages. These figures match almost exactly the results obtained in the 1985 study by the Canadian Forestry Service and the Ministry of Forests and Lands. Contracts are clearly highly labour-intensive.

Of the remaining costs, nearly 15% are attributable to equipment and supplies (considerably higher than the comparable figure of 3.8% in the 1985 study), 4.45% to transportation (8.8% in 1985), and 3.37% to camp costs (7.8% in 1985).

In contrast to tree planting contracts, these projects have smaller crews, who require a variety of equipment and supplies, and they are located at less remote locations.

Table 2

% of Wage & Wage Related Contract Costs by Type of Contract				
Type of Contract	Supervisors	Crew	Cooks	WCB & Other
Site Rehabilitation	16.60%	66.80%	0.50%	16.20%
Site Preparation	11.40%	80.20%	1.50%	7.00%
Mech Brush & Weed	13.20%	79.10%	1.30%	6.40%
Chem Brush & Weed	21.80%	66.10%	4.90%	7.10%
Juvenile Spacing	14.60%	76.10%	1.00%	8.30%
Conifer Release	10.60%	80.10%	2.90%	6.40%
Fertilization				
Planting	14.20%	77.40%		8.50%
Overall	15.50%	74.70%	1.70%	8.20%

Table 2 shows wage costs attributable to supervisors, crew, cooks and helpers and the Worker's Compensation Board Assessment and other wage related costs, by the various categories of contract. On the average, 15.5% of wage and wage-related costs are paid to supervisors-who in many cases were also contractors and/or also worked as crew; 74.7% to crew, 1.7% to cooks and helpers, and 8.2% to the Worker's Compensation Board Assessment and other wage related costs.

Wage and wage-related costs can also be described by type of contract. Wages paid to supervisors range from the high of 21.8% of the total payroll in chemical brushing and weeding, down to 10.6% in conifer release; wages paid to crew range from 80.1% in conifer release to 66.1% in chemical brushing and weeding; wages paid to cooks and helpers were comparatively insignificant, ranging from 4.9% in chemical brushing and weeding to 0.5% in site rehabilitation; the Worker's Compensation assessment and other wage-related costs ranged from a significant bite of 16.2% in site rehabilitation to 6.4% in both chemical brushing and weeding and conifer release.

Supervision costs are highest, not surprisingly, where sensitive herbicide applications are undertaken.

Figure 4

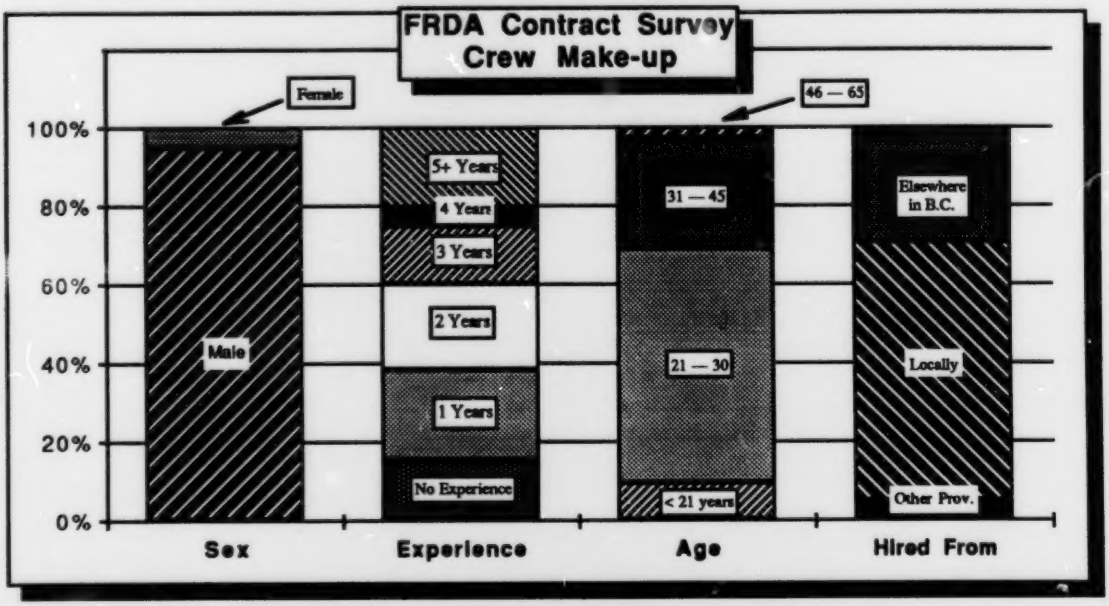


Figure 4 shows the characteristics of crews on all contracts on all regions by four categories: sex; experience in silviculture; age; and place of hiring (which may be compared to the permanent residence information derived from the Workers' Questionnaire). Crew members were overwhelmingly male; only 5% were female. Experience varied considerably; 20% had five or more years, 5% four years, 14% three years, 22% two years, 23% one year, and 16% no experience whatever. This suggests a relatively high turnover of workers in the field on FRDA contracts.

With regard to the use of union versus non-union labour, 142 or 98.6% of the contracts examined reported the exclusive use of non-union labour.

Figure 5

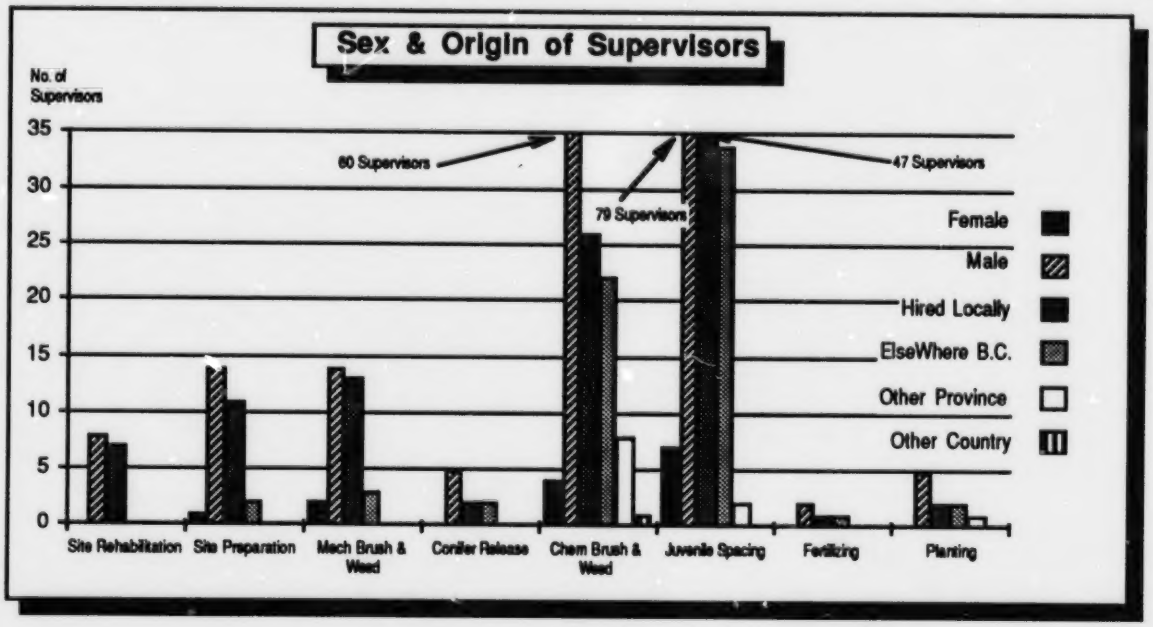


Figure 5 provides information by type of contract on two characteristics of supervisors: sex and source of hiring. In the aggregate, 90% of supervisors were male, and 58% were hired locally and a further 30% from elsewhere in B.C. No significant differences emerged among the various categories of contract in the distribution by sex or place of origin of supervisor.

Figure 6

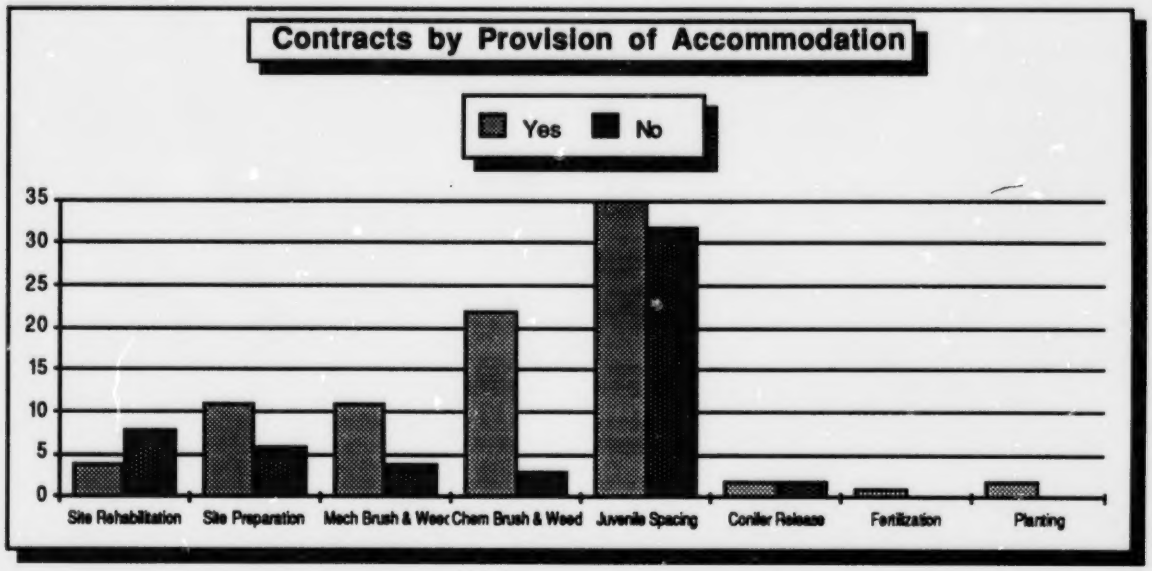


Figure 6 deals with the provision of accommodation by type of contract. In the aggregate, accommodation was provided in 62% of contracts. No significant differences emerged among the various categories of contract with respect to the provision of accommodation, except in juvenile spacing, where accommodation was provided in slightly over 50% of cases.

Figure 7

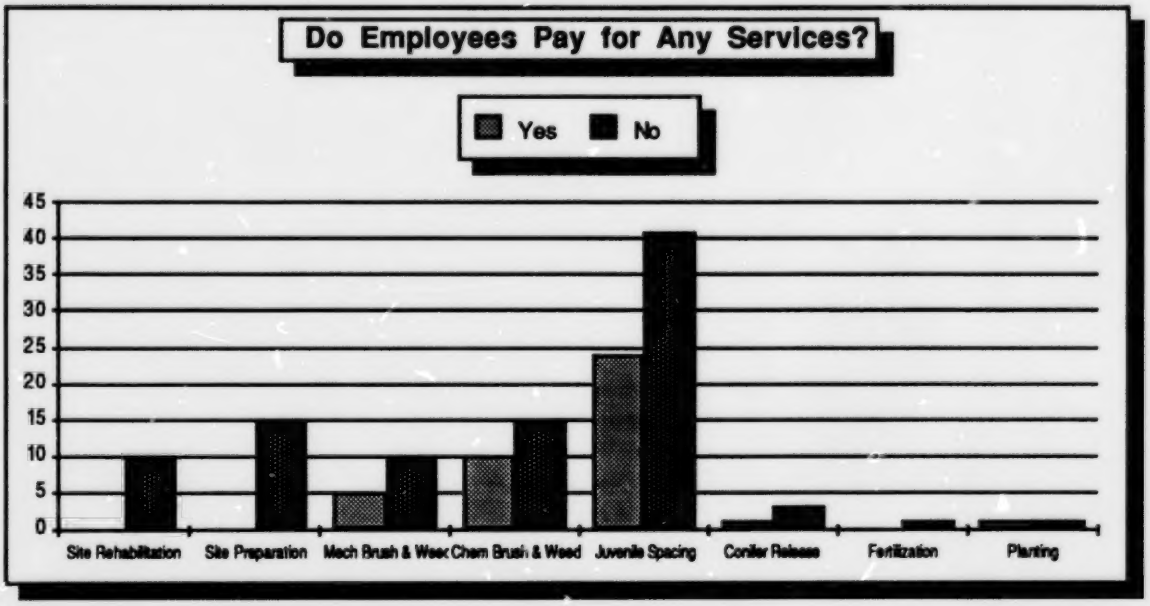


Figure 7 provides information by the various categories of contract on whether or not employees were required to pay for services. In aggregate, employees paid for services in 30% (41 of 137 cases) of contracts. No payment was required in site rehabilitation and site preparation contracts but payment was required in 33% (5 of 15 cases) of mechanical brushing and weeding contracts 40% (10 of 25 cases) of chemical brushing and weeding contracts, and 37% (24 of 65 cases) of juvenile spacing contracts.

C Workers

i) Response rate:

The questionnaire was administered as a census of all workers in all contracts operating in the Fall period of the total of 1,020 questionnaires provided to workers 307 were returned completed for a response rate of 30% These returns in aggregate were made up of responses reasonably representative of the various categories of

contract: 31 responses from site preparation and site rehabilitation, 107 from brushing and weeding, 150 responses from juvenile spacing and conifer release, 16 from fertilization, and 3 from planting.

ii) Findings and Analysis:

Table 3

Contract Location By Contract Type									
Contract Location	Site Rehabilitation	Site Preparation	Mech. Brush & Weed	Chem. Brush & Weed	Juvenile Spacing	Conifer Release	Fertilization	Planting	Total
BC Coast			10	35	37		12	3	97
Northern Interior	4	5	10	7	24	2	4		56
Southern Interior	1	21	30	15	87				154
Sum	5	26	50	57	148	2	16	3	307

Table 3 presents information on the number of workers by type of contract and contract location. In the aggregate by region, 97 workers were employed in contracts in the coastal region, 56 in the northern interior, and 154 in the southern interior. By category of contract, 5 workers were employed in site rehabilitation, 26 in site preparation, 50 in mechanical brushing and weeding, 57 in chemical brushing and weeding, 148 in juvenile spacing, 2 in conifer release, 16 in fertilization, and 3 in planting.

Table 4

Permanent Residence by Contract Location

Contract Location	Permanent Residence: BC Coast	BC Northern Interior	BC Southern Interior	Province of Alberta	Province of Quebec	Canada	Total
BC Coast	95	1	1				97
Northern Interior	3	49	4				56
Southern Interior	18	15	117	1	1	1	153
Sum	**116**	**65**	**122**	**1**	**1**	**1**	**306**

Table 4 deals with the permanent residence of workers defined in 6 categories (B.C. coast, B.C. Northern Interior, B.C. Southern Interior, Alberta, Quebec, and the rest of Canada) by the location of contracts in the 3 regions (B.C. Coast, Northern Interior, and Southern Interior). The message is very clear: without exception workers employed in each region are drawn overwhelmingly from the population of workers whose permanent residence is in that region.

Figure 8

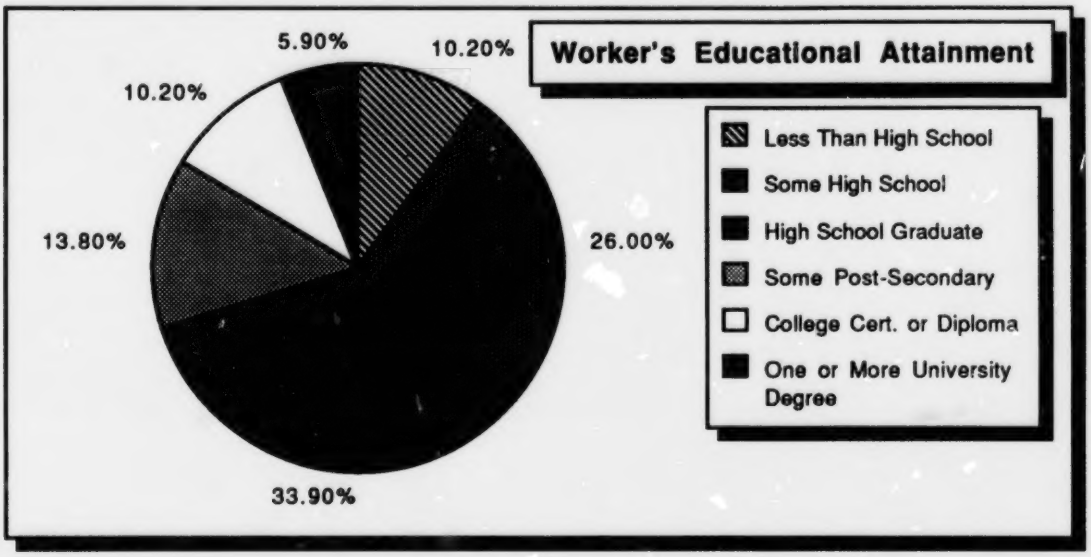


Figure 8 shows the breakdown of Workers' Educational Attainment. Post-secondary qualifications of some sort had been completed by 16.1% of workers, and a further 13.8% had some post-secondary experience. High school graduates comprised some 33.9% of the total, and a further 26% had some high school experience. Only 10.2% had attained less than high school. Workers may therefore be considered to be reasonably well educated, but those who responded to this Fall study were less well educated than those who responded to the 1985 study conducted over the summer, in which 37% of respondents were students and at least 25% had at least one degree.

Most of the workers (96.4%) did not belong to the Pacific Reforestation Workers Association, a voluntary organization within the industry.

Table 5

Summary of Other Skills & Experience of the Work Force

	1988-89		1985	
	N	%	N	%
Forestry and Logging	66	20	24	10
Construction Trades	61	18	39	16
Service	30	9	35	14
Product Fabrication, Assembling & Repairing	30	9	18	7
Farming, Horticulture & Animal Husbandry	26	8	24	10
Processing	19	6	N/A	N/A
Mining & Quarrying Including Oil and Gas Field	13	4	N/A	N/A
Artistic, library, Recreational & Related	12	4	31	12
Sales	12	4	14	6
Fishing, Trapping & Related	10	3	9	4
Managerial, Administrative & Related	9	3	N/A	N/A
Transport Equipment Operating	9	3	N/A	N/A
Natural Sciences, Engineering & Mathematics	8	2	7	3
Medicine and Health	5	2	8	3
Clerical & Related	4	1	13	5
Teaching & Related	4	1	N/A	N/A
Miscellaneous Other Occupations	10	3	29	10
Total	328	100	251	100

Table 5 breaks down the previous skills and experience of the workforce by categories comparable to those used in the 1985 study. Of the 223 workers who responded to this question, many indicated more than one previous occupation, and there is therefore some double counting in the results. Broadly, however, the distribution by number and percentage emerged as shown in Table 5.

The top 5 categories account for 64% of the 1988-89 occupations and 57% of the 1985 occupations. The main differences are forestry & logging (20% vs 10%), artistic etc. (4% vs 12%) and clerical (1% vs 5%).

Figure 9

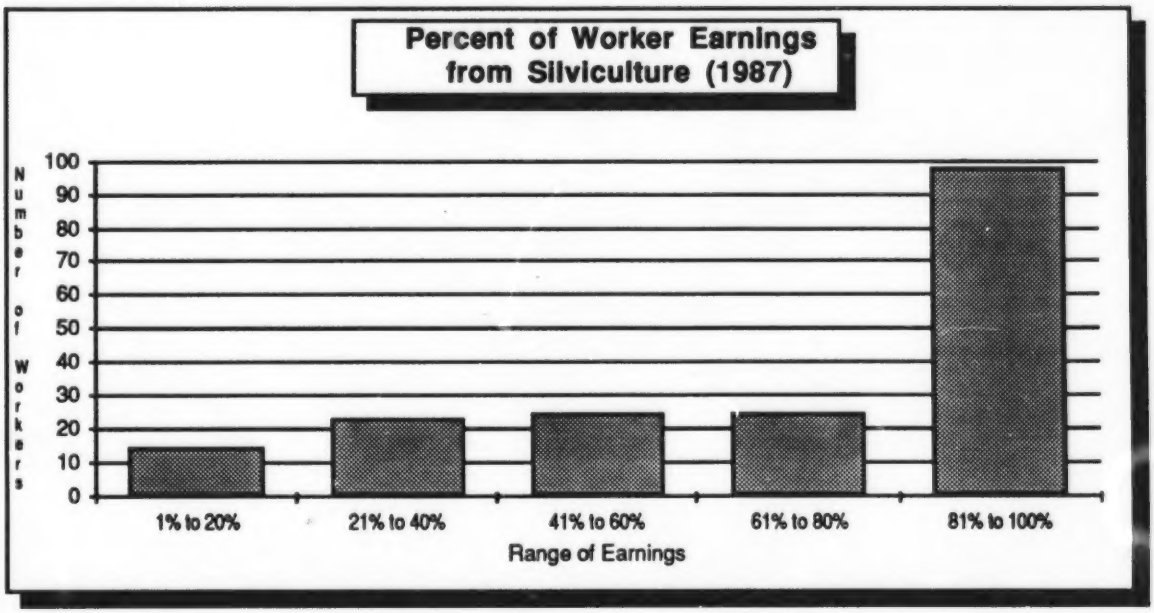


Figure 9 illustrates workers' incomes from silviculture as a proportion of total income for 186 reporting workers.

On average, 74.7% of reported 1987 income was derived from silviculture contracts, according to the responses received.

Of 105 workers who responded, 59.2% of their 1987 silviculture income was derived from FRDA contracts.

Experience in Silviculture:

On the average, workers had worked 4 years (or seasons) in silviculture, and had worked on a total of 14 silvicultural projects of one form or another. Those who worked in silviculture in 1987, had worked for 19.4 weeks on the average.

V Appendix

1. Contractor Questionnaire
2. Worker Questionnaire

Canada BC

All information provided in this questionnaire will be treated as strictly confidential

Deloitte Haskins + Sells

F.R.D.A. Silvicultural Contractor Questionnaire

General

1. Company name: _____

   Address: _____

   _____

   P.O. Box, R.R., or street or number

   _____

   City Province Postal Code

2. Person responding: _____

   Name Phone

3. Forest Service Contract number: _____

4. Forest Region: _____

5. Forest District: _____

6. Total hectares treated _____ ha

7. Total bid price $ _____

8. Are you a member of the Western Silvicultural Contractors Association?

   yes _____ no _____

9. Is this a union job? yes _____ no _____

   If yes, which union? _____

10. Do you provide accommodation for your employees?

    yes _____ no _____

11. Type of accommodation (check appropriate line):

Commute	_____	Motel/hotel	_____
Tent camp	_____	Logging camp	_____
Trailer camp	_____	Other	_____
			(Please specify)

12. Do you provide cooks, food and cook shack?

yes _____ no _____

13. Do you charge your employees for their accommodation and other services provided?

yes _____ no _____

If yes, what amount per day and what services? (check appropriate line(s))

$ _____

Accommodation _____
Food _____
Transportation _____
Other _____

B. Employment and Labor Force

1. Contract supervisors (e.g., layout, quality control):

a. Number of supervisors employed ? _____ male _____ female

b. Age distribution of supervisors:

Number 20 years or less _____
Number 21-30 years _____
Number 31-45 years _____
Number 46-65 years _____
Number 66+ years _____

c. Silvicultural experience of supervisors:

Number with 0 year's experience _____
Number with 1 year's experience _____
Number with 2 year's experience _____
Number with 3 year's experience _____
Number with 4 year's experience _____
Number with 5+ year's experience _____

d. Geographic distribution of hirings:

Number of supervisors for this contract hired from:

Other province/territory _____ Locally (near project) _____
Other country _____ Elsewhere in B.C. _____

e. Total employment in contract supervision for this contract:

_____ total days worked by all supervisors
_____ average hours worked per day by a supervisor
_____ average days worked per week by a supervisor

F.R.D.A. Silvicultural Contractor Questionnaire

2. Crew (eg., planters/operators, slashers, etc.)

   a. Number employed: _____ male _____ female

   b. Age distribution of general labor force:
      Number 20 years or less _____
      Number 21-30 years _____
      Number 31-45 years _____
      Number 46-65 years _____
      Number 66+ years _____

   c. Silvicultural experience of general labor force:
      Number with 0 year's experience _____
      Number with 1 year's experience _____
      Number with 2 year's experience _____
      Number with 3 year's experience _____
      Number with 4 year's experience _____
      Number with 5+ year's experience _____

   d. Geographic distribution of hirings:

      Number of workers for this contract hired from:

      Other province _____ Locally (near project)_____

      Other country _____ Elsewhere in B.C. _____

   e. Total general labor for this contract:

      _____ total days worked by the labor force

      _____ average hours worked per day by a worker

      _____ average days worked per week by a worker

3. Cooks and helpers:

   a. Number employed: _____ male _____ female

   b. Age distribution of general labor force:
      Number 20 years or less _____
      Number 21-30 years _____
      Number 31-45 years _____
      Number 46-65 years _____
      Number 66+ years _____

c. Geographic distribution of hirings:

Number of cooks and helpers for this contract hired from:

Other province/territory _____ Locally (near project) _____

Other country _____ Elsewhere in B.C. _____

d. Total cooks and helpers for this contract:

_____ total days worked by the cooks and helpers

_____ average hours worked per day by a cook or helper

_____ average days worked per week by a cook or helper

4. Other labor (i.e., office workers, truck drivers, etc.):

a. Please specify job types:

_____

_____

_____

b. Number employed: _____ male _____ female

c. Age distribution:

Number 20 years or less _____

Number 21-30 years _____

Number 31-45 years _____

Number 46-65 years _____

Number 66+ years _____

d. Geographic distribution of hirings:

Number of workers for this contract hired from:

Other province/territory _____ Locally (near project) _____

Other country _____ Elsewhere in B.C. _____

e. Total other labor for this contract:

_____ total days worked by all other labor

_____ average hours worked per day by a worker

_____ average days worked per week by a worker

F.R.D.A. Silvicultural Contractor Questionnaire

C. Costs

1. Wages paid for this project:
   a. WCB assessment _____
   b. Supervision Total wages paid _____
   c. Crew: Total wages paid _____
   d. Cooks and helpers: Total wages paid _____
   e. Other labor: Total wages paid _____

2. Other costs:

   Total $_____

   If a more detailed breakdown of costs in any or all of the following categories is easily available, please provide:

   a. Equipment and supply costs: $_____
      (e.g., gas and oil, repairs, power saws, fire and first aid equipment, etc.)
   b. Camp costs: $ _____
      (e.g., set-up costs, food, propane, etc.)
   c. Transportation costs: $ _____
      (eg., rental, gas, insurance, etc.)
   d. Other costs $ _____
      (e.g., office overhead, loan interest, site inspection, etc.)

D. Total Contract Income

What percentage of your total silviculture contract income in 1987 came from FRDA contracts?:

_____ % approximately.

Thank you for your particiapation in this survey.

If you have any other comments that you would like to make, please use the space provided below and on the other side of this page. _____

Canada BC

All information provided in this questionnaire will be treated as strictly confidential

Deloitte Haskins + Sells

Silvicultural Worker's Questionnaire

1. Position (supervisor, planter, etc.) _____ .

2. Where is your permanent residence?

   City _____ Province _____ .

3. Educational attainment:

Less than high school	_____	Some high school	_____
High school graduation	_____	Some post secondary	_____
College certificate or diploma	_____	University degree	_____
More than 1 university degree	_____		

   Are you still a student? yes _____ no _____

4. How long have you worked in silviculture?

   Number of years (seasons) _____ Number of projects_____

5. Are you a member of the Pacific Reforestation Workers Association?

   yes _____ no _____

6. In what other major occupations have you had recent experience or training?

   _____

   _____

7. How many weeks did you work on silviculture in 1987? _____ weeks

8. If you did not work on silviculture in 1987, what was your occupation?

   _____

9. What did you earn from silviculture (gross pay) in 1987? (check appropriate line)

Under $3,000	_____	$8,000-$9,999	_____
$3,000-$5,999	_____	$10,000-$14,999	_____
$6,000-$7,999	_____	$15,000-$19,999	_____
	_____	$20,000 or more	_____
		(Please Specify)	

   Can you estimate what percentage of these earnings came from the Canada/BC Forest Resource Development Agreement (FRDA) contracts? _____ %

10. What were your total earnings in 1987? (check appropriate line)

Under $3,000	_____	$8,000-$9,999	_____
$3,000-$5,999	_____	$10,000-$14,999	_____
$6,000-$7,999	_____	$15,000-$19,999	_____
	_____	$20,000 or more	_____
		(Please Specify)	

_____

FRDA Contract # _____